Where Performance And Reliability Counts

Lighting Systems

LSC

WALLPAK OPERATOR MANUAL

Version 4.2

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1.0 DESCRIPTION

The WALLPAK Dimmers - designed and manufactured in Melbourne, Australia by LSC Lighting Systems - provides either 12 channels of 10 Amp or 6 channels of 20 Amps. Each channel is protected by a fast acting MCB (Miniature Circuit Breaker). The WALLPAK Dimmer incorporates *Current Control Technology* to minimise any nuisance tripping from high inrush currents.

The WALLPAK Dimmer offers 6 different dimmer response curves per phase. These can be selected by the user via dip switches mounted on the front panel. See Section 9 Page 8 for further information.

The WALLPAK Dimmer accepts a multiplexed Digital control signal

The DMX512 start address is set by three easy to read rotary switches which allow a discrete address to be set between 001 and 512.

The unique construction of the WALLPAK Dimmer means that it is ideal for use permanent installations.

Useful features include the ability to bring up any single channel or all 12 channels, for testing or for focusing, in 10% increments between 0 and Full without connecting a control desk. The "channel latch" function enables a scene to be set up, again without using a desk, for static display, preheat or emergency back-up.

An LED Output Display provides a mimic of channels currently in operation and also indicates a tripped MCB or phase failure.

Two LEDs give a real time indication of rack and DMX error status.

Three in-built chase patterns are also available.

2.0 TECHNICAL SPECIFICATIONS

- 12 (6) Channels.
- 10 Amps (20 Amps) Max per Channel.
- Power Supply: nominal three phase 240/415 Volt 50/60Hz, 40 Amp (max.) per phase. The dimmer will also operate on 110/208 Volts 50/60Hz 40 Amps Max . This supply must be fused, isolated and have a full rated neutral.
- Single phase operation is also possible but requires factory modification. Please contact your distributor for details.
- 12 (6) MCBs are fitted to the front panel for channel protection.
- 1 x M205 fuse is fitted internally for control electronics.
- 12 x LED indicators show when channels are being driven, if a MCB has tripped or phase failure.
- LED indicators also indicate the status of the Dimmer and the DMX512 input.
- Channel Select and Rate switches allow testing of any channel at 10% steps between 0 and Full.
- Optional scene memory available that allows a scene to be built with out the need of a desk.
- Chase patterns available without connecting desk to rack.
- 6 User selectable fade curves, selectable per phase.
- Quality toroidal inductors ensure high RF suppression.
- Microprocessor based operation.

DIGITAL

- EIA485 (EIA-422) Communications Link. Accepts DMX512
- Control connection: Front mounted 5 pin Male XLR microphone style connector.
- Link to further dimmers via front mounted 5 pin Female XLR microphone style connector.
- Three Address switches enable starting address of each dimmer to be set between 1 and 999 (1 to 512 are valid DMX512 address).

Dimensions

435mm(w) x 440mm(h) x 150mm(d)

Construction

Constructed from zinc steel. The front is finished in charcoal grey powder coat, And the chassis is finished in textured black powder coat.

Weight

25kg

3.0 WIRING

3.1 Input Supply

The WALLPAK Dimmer is designed to be connected to a 240/415 Volt three phase supply rated at 40 Amp per phase. Input power connection is provided by six 10 mm^2 terminal blocks located within the cabinet. The connections provided by this block are shown in the diagram below.

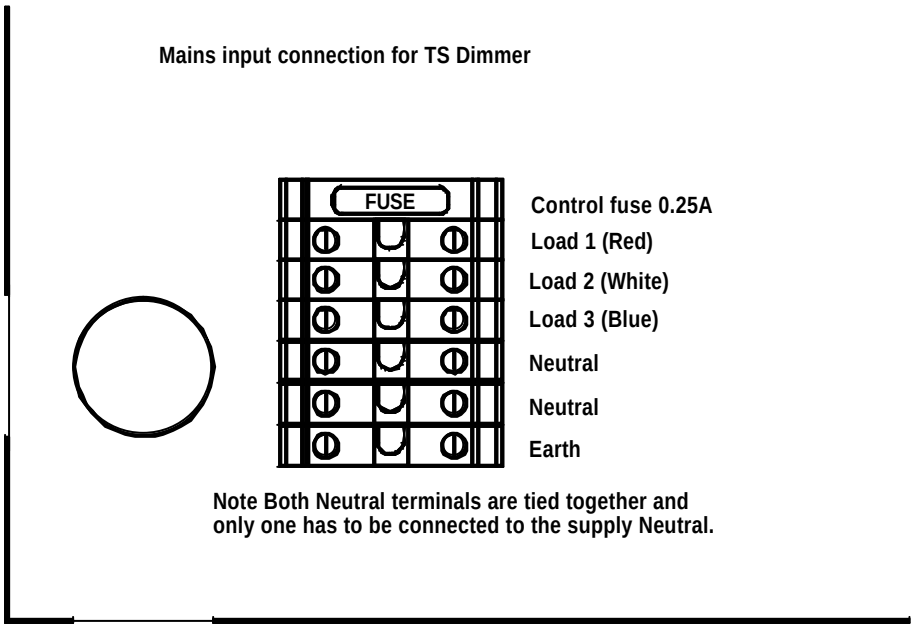
Please note that it is essential for a neutral to be provided in order to avoid damage to the dimmer and loads.

If for any reason the second or third phase of power is not reaching the dimmer rack then the LED Display will show this by flashing all four LEDs on the second or third power phase. If two power phases are not reaching the dimmer rack then the LED Display will show this by flashing all eight LEDs associated with those two phases. LED status indications are listed at Appendix 8 on page 18. As the WALLPAK Dimmer draws power for its internal electronics from the First Phase, the rack will not function if power from this phase is not reaching the dimmer.

A thermistor thermal cut out device is used to protect the WALLPAK Dimmer from overheating. This will reset its self once normal operating temperature has been achieved.

Power entry is via either of the three 32mm holes located at the bottom left corner rear of the dimmer. Two blanking plugs are supplied to allow the unused holes to be closed for safety. The mains connection can be via either the lower left hand side, the left hand side of the bottom panel, or through the bottom left corner of the rear panel.

Fig. 1. Mains Input Termination.



Note: *For Single phase operation both the Neutral and single Active terminal will accept 35mm^2 cable. During Single phase operation the Neutral current can be as high as 120 Amps. This version should be specified at time of ordering. If you wish to convert an existing unit please contact LSC for advice.*

3.2 Control Wiring - Digital Dimmers

In compliance with the specifications of DMX512 connection from the control desk to the Dimmer is made via a male 5 pin XLR microphone style connector. The pin connections for these are listed in Appendix 1 on page 12. A female 5 pin XLR microphone style connector is provided to enable linking of further DMX512 based products.

3.3 Load Connection

The WALLPAK is constructed with 3 pin HPM outlets on each channel. Current four variations of these are available.

Option 1. 12 x 10 Amp. Single outlets. (WPCB/1210)
Each channel is fitted with a single 10 Amp HPM outlet.

Option 2. 12 x 10 Amp. Double outlets (WPCB/1210P)
Each channel is fitted with two 10 Amp HPM outlets.

Option 3. 6 x 20 Amp. Single outlets. (WPCB620)
Each channel is fitted with a single 20 Amp HPM outlet.

Option 4. 6 x 20 Amp. Double outlets. (WPCB620)
Each channel is fitted with two 20 Amp HPM outlet.

Note: A screw terminal model is also available. This version incorporates internal fan cooling and is designed to handle the extra load imposed by architectural use. Please contact LSC for further information.

4.00 OVER LOAD PROTECTION

A total of 12 (6) MCBs and 1fuse are provided for the protection of external loads, wiring and control electronics.

Twelve (6) MCBs are provided on the front panel, one for each of the output circuits. These MCBs are rated at 10 Amps (20 Amps)

When a MCB has tripped it will be indicated by a double flash on the appropriate LED in the LED output Display. See Appendix 2 on page 13 for a full list of LED status indications.

A further fuse, located on the mains terminal strip inside the unit, provides protection for the internal electronics. This glass fuse is a 3AG type rated at 0.25 Amp for the electronics and should normally never need replacing. If however this fuse blows consistently, an internal problem is likely and qualified assistance should be sought.

Please ensure that the fuse is securely fixed in its holder before use as vibration in transit may have loosened it.

5.00 MOUNTING

Your WALLPAK Dimmer has been designed for permanent installation, or portable use with the optional 50mm hanging bracket of floor mount roll cage.

When installing the unit, be sure not to obstruct the ventilation slots on each unit. To ensure adequate ventilation ensure that air flow from the bottom or top of the dimmer is not obstructed. Allow at least 100mm clearance above and below. Cool air is drawn from the bottom, through the MCBs and exhausted out the top of the dimmer

Note: I*nstallation drilling template is included with this manual.*

6.0 TRIMMING - (Analog version/option only)

The intelligent, up to date circuitry of your WALLPAK Dimmer can accept either a positive or negative analog control signal and a wide range of control voltage levels. The polarity selection is automatic and the Dimmer Pack is adjusted for a nominal 0 to 10 Volt maximum control signal, when shipped from the factory.

Trim controls are provided for Top-end and Bottom-end level adjustments. These trim pots are situated in the right-hand corner on the front of the unit and are accessed by removing the whole front panel. The bottom set is the bottom pot and the top set is the top pot (as viewed from the front).

7.00 THE CHANNEL SELECT FUNCTION

To bring up a channel without having to connect a control desk, first select the Channel Number via the Channel Select Knob (note that the "ALL" setting brings up all 12 channels) then select the level using the % Drive Knob.

In addition to the level settings at 10% intervals between 0 and Full there are four "Ramp" settings. These allow a selected channel to fade slowly up to Full and then snap to 0. Each of the four positions has a different speed setting for the fade time.

7.1 The Channel Latch Function

A special "channel latch" function has been added to the WALLPAK Dimmers. This offers the ability to use the Channel Select and % Drive Knobs to dial up a "scene". If this facility is required then switch number 7 on the Fade Curve Select switches must be in the ON position. (These switches are located on the right hand side on the front. The on position is achieved by pushing the switch to the up position)

Once this function has been selected the Channel Select and % Drive Knobs are used in the normal way to call up an output from a specified channel. When a new channel is selected via the Channel Select Knob the setting for the old channel will be maintained. It is, therefore, possible to move through from Channel 1 to Channel 12 creating a setting for each channel. A mimic level of the channel drive will be displayed on the channel drive LEDs. See Appendix 2 on page 13 for a full list of LED status indications.

Once a setting has been made it can be turned off by moving fade curve select switch Number 7 to the OFF position. As long as the power to the dimmer hasn't been turned off the scene can be restored by moving fade curve select switch Number 7 to the ON position.

Unless you have the optional "Scene Memory Storage" (see Section 12 on Page 11) facility settings are lost when power to the dimmer is turned off.

Dip switch 8 7	Function
OFF	Channel Latch function is OFF.
ON	Channel Latch function is ON.

8.0 THE CHASE FUNCTION

Without connecting the WALLPAK Dimmer to a control desk it is possible to obtain three different Chase Patterns. These are obtained by setting the Channel Select Knob into either the A, B or C positions. The % Drive Knob then becomes a speed control for these Chase Patterns.

The three standard Chase Patterns are as follows:-

- A. A 12 step chase progressing from Channel 1 to Channel 12.

- B. A 4 step chase using channels 1, 2 & 3 as step one, channels 4, 5, & 6 as step 2, channels 7, 8, & 9 as step 3 and channels 10, 11, & 12 as step 4.

- C. A random chase using all channels.

The "Ramp" positions on the % Drive Knob cause the Chase Speed to gradually increase until it reaches its maximum and then snap back to the slowest speed. Experimentation here can produce some interesting effects particularly with the random chase.

9.0 SELECTING FADE CURVES

Four fade curves are available in each WALLPAK Dimmer :-
S LAW, SQUARE LAW, CUBE LAW and QUAD LAW. These are selected via switches 1 to 6 of the Fade Curve Select Switches. (Located on the right hand side of the front panel).

The 120 VOLT curve - is primarily for use with Par 64 lanterns. The curve incorporated is an S curve and approximates the same fade as 2 Par 64's in Series using the 240 Volt S curve. To activate the 120 Volt fade curve set switch 2 of the four way dip switch on and select Quad Law on the 8 way dip switch.

Please note that only one Par 64 can be connected to each dimmer channel when the 120 VOLT curve is used. Care must be taken that the dimmer is fitted with the 120 VOLT curve and that the correct curve is selected for all relevant channels. In all cases LSC Lighting System's takes no responsibility for damage to lamps operated in this manner.

See page 8 for dip switch setup table.

Fade Curve Select Switch Settings

THE FIRST PHASE

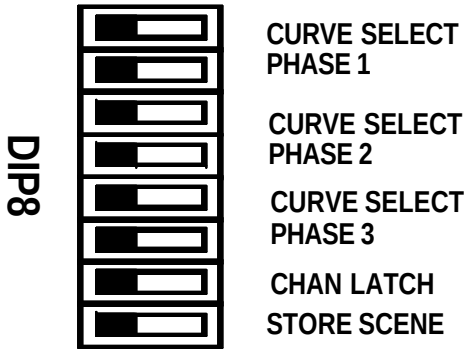
Channels	Dip Switch 1	8 Switch 2	Dip 4 Switch 2	Function
1,4,7 & 10	OFF	OFF	OFF	S Curve
1,4,7 & 10	OFF	ON	OFF	Square Law
1,4,7 & 10	ON	OFF	OFF	Cube Law
1,4,7 & 10	ON	ON	OFF	Quad Law
1,4,7 & 10	ON	ON	ON	120 V S Curve

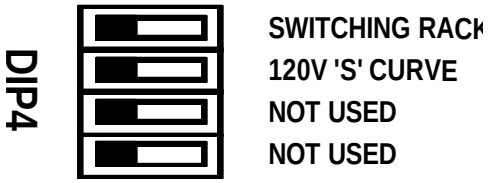
THE SECOND PHASE

Channels	Dip Switch 3	8 Switch 4	Dip 4 Switch 2	Function
2,5,8 & 11	OFF	OFF	OFF	S Curve
2,5,8 & 11	OFF	ON	OFF	Square Law
2,5,8 & 11	ON	OFF	OFF	Cube Law
2,5,8 & 11	ON	ON	OFF	Quad Law
2,5,8 & 11	ON	ON	ON	120 V S Curve

THE THIRD PHASE

Channels	Dip Switch 5	8 Switch 6	Dip 4 Switch 2	Function
3,6,9 & 12	OFF	OFF	OFF	S Curve
3,6,9 & 12	OFF	ON	OFF	Square Law
3,6,9 & 12	ON	OFF	OFF	Cube Law
3,6,9 & 12	ON	ON	OFF	Quad Law
3,6,9 & 12	ON	ON	ON	120 V S Curve





Note: *See Section 13 Page 11 for further detail on Switching Rack operation.*

10.0 THE ADDRESS SETTINGS

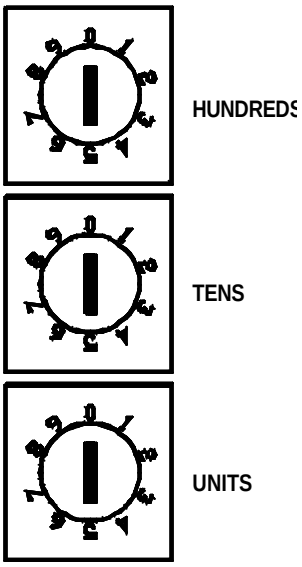
On the front panel of the WALLPAK Dimmers there are three switches, each allowing the selection of a number between 0 and 9. These are the address switches.

Address switches are used because the digital signal contains information for a large number of channels (DMX512 protocol allows for 512 channels) and any one WALLPAK Digital Dimmer can only deal with 12 (6) of them. Hence it is necessary to select which 12 (6) will be relevant. For example if an address of 001 is selected then that dimmer will respond to control desk channels 1 to 12 (6). If an address of 152 is selected that dimmer will respond to desk channels 152 to 163 (157).

The WALLPAK Dimmer allows for an address setting of 999 to be set of which only 001 to 512 are valid for DMX512. Dimmer addresses can be overlapped ie more than one dimmer may be responding to the same group of control channels

The table below gives some common address settings. Most of the time a group of dimmers may be addressed sequentially from address 1 up wards in groups of 12. Some times the dimmers address is referred to as a Bank address. An example of these bank numbers are listed below.

Address setting	Responds to control channels	Bank Number
0 0 1	1 to 12	1
0 1 3	13 to 24	2
0 2 5	25 to 36	3
0 3 7	37 to 48	4
0 4 9	49 to 60	5
0 6 1	61 to 72	6
0 7 3	73 to 84	7
0 8 5	85 to 96	8
0 9 7	97 to 108	9
1 0 9	109 to 120	10
1 2 1	121 to 132	11
1 3 3	133 to 144	12



Note: *If an address of 000 is selected the dimmer is effectively turned off and the red error LED will double flash to indicate this.* *See Appendix 2 on page 13 for a full list of LED status indications.*

11.0 PROTOCOLS AND BAUD RATES

The WALLPAK Dimmer has been designed primarily for use with equipment using the DMX512 digital data transmission standard (see Appendix 3 on page 14). This international standard deals with connectors, cable, maximum numbers of dimmers, protocols and baud rates.

12.0 SCENE MEMORY STORAGE OPTION

To operate first set a scene using either the Channel Latch Function (see Section 7.01 on Page 7) or by using a control desk connected to the input. Moving Fade Curve Select switch 7 to ON and toggling switch 8 from OFF to ON to OFF to store the output of the dimmer.

Please note that leaving the Fade Curve Select Switches 7 and 8 in the On position will not mean that any subsequent changes are saved as the settings will only be read at the moment that Switch 8 is moved from OFF to ON. Switch 8 should then be returned to OFF ready for the next operation.

Once a scene has been saved it will be held in memory even when power to the dimmer is turned off.

To replay the stored memory Fade Curve select switch 7 should be in the ON position.

Dip 8 Switch 7	**Dip 8 Switch 8**	**Function**
ON	OFF	Channel latch mode (see page 7)
ON	OFF-ON-OFF	Current output of dimmer saved
ON	OFF	Saved output replayed
OFF	ON	No effect

13.0 SWITCHING OUTPUT

The WALLPAK output can be changed from being a dimmable channel to being a switched all relay type output. Switched output is used for driving motors or similar type loads. To activate switching output, select switch 1 of the four way dip switch to on. The switching levels are 60% to turn the output on and 40% to turn the output off. These different thresholds provide a degree of hysteresis, which minimise channels chattering when the channel level is set to 60%.

Dip 4 Switch 1	**Function**
ON	All 12 channels will operate as non dim. le Switched

14.0 APPENDIX 1: Control Cable and Plug Connections – DMX512.

The following is an extract from the specifications as laid down in the DMX512 standard (see Appendix 3 on page 14):

1.0 CONNECTORS

Where connectors are used, the data link shall utilise 5-pin "XLR/AXR" style microphone connectors. Some manufacturers of this connector are:

Switchcraft
Neutrik

1.1 Connector Sex

Female connectors shall be utilised on controllers or other transmitting devices and male connectors shall be utilised on dimmers and other receiving devices. In cases where an optional second data link is implemented using the spare
pins of the connector for directional transmission, female connectors shall still be utilised on the controller.

1.2 Connector Pin Designation

Connector Pin Designations shall be as follows:

Connector Pin	Function
Pin 1	Signal Common – Shield or cable screen
Pin 2	Dimmer Drive Complement (Data 1 Negative)
Pin 3	Dimmer Drive True (Data 1 Positive)
Pin 4	Dimmer Drive Compliment (Data 2 Negative)
Pin 5	Dimmer Drive True (Data 2 Positive)

2.0 CABLE

Cable shall be shielded twisted pair approved for EIA422/EIA485 use.

Available from LSC Lighting Systems or our representatives.

15.0 APPENDIX 2: LED Operation & Error Indicators

Led	Indication	Reason	Remedy
Chan 1 – 12	Solid 0 to 100%	Normal indication of Channel drive	Normal operation
Chan 1 – 12 No DMX applied	Solid 0 to 100%	Channel Latch or Scene replay enabled See section 7 or Section 12	Normal operation
Chan 1 – 12	Double Flash	Channel MCB Tripped	Reset Channel MCB
Chan 1,4,7&10	Single Flash	Phase 1 failed	Check phase 1 and correct
Chan 2,5,8&11	Single Flash	Phase 2 failed	Check phase 2 and correct
Chan 3,6,9&12	Single Flash	Phase 3 failed	Check phase 3 and correct
Data (Green)	Solid	DMX512 received and good. At least one channel within the dimmer's address range is been driven by the DMX signal.	Normal operation
Data (Green)	Flashing (may be random)	DMX512 received and good. No channels within the dimmer's address range are been driven by the DMX signal.	Normal operation. Some consoles do not produce 512 channels of information or do not send every packet with 512 channels of information.
Error (Red)	Solid	Bad DMX512. The dimmer is receiving bad, corrupted or non spec DMX512 data.	Check cabling and DMX512 signal for compliance to USITT standard.
Error (Red)	Flashing (may be random)	The dimmer has received a bad packet of DMX512. ie only a few bits of data have been corrupted.	Check cabling and DMX512 signal for compliance to USITT standard.
Error (Red)	Double Flash	Address switch set to 000	Set valid DMX start address